Broward Boulevard Transit Corridor Workshop

February 5, 2010

9:00 AM – 12:30 PM

FDOT District IV Auditorium

Bus Rapid Transit Presentation

Bus Rapid Transit (BRT) Technology

(1) General Overview

(2) History of BRT in U.S.

- Busways
- Downtown Circulator BRT
- HOV/BRT
- Arterial BRT

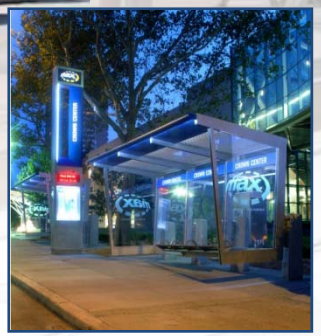
(4) Recent Trends in BRT

(5) Arterial BRT Design Elements

(6) Project Costs

General Overview: What is BRT?

- "Rail-like" service using rubber tires
  - BRT is a bundle of service strategies and facility improvements that provide a premium level of bus service relative to the existing bus network



General Overview: What is BRT?

- Primary Objectives of BRT
  - Improve travel reliability
  - Improve travel time
  - Improve the customer experience
  - Maximize limited capital or operating resources

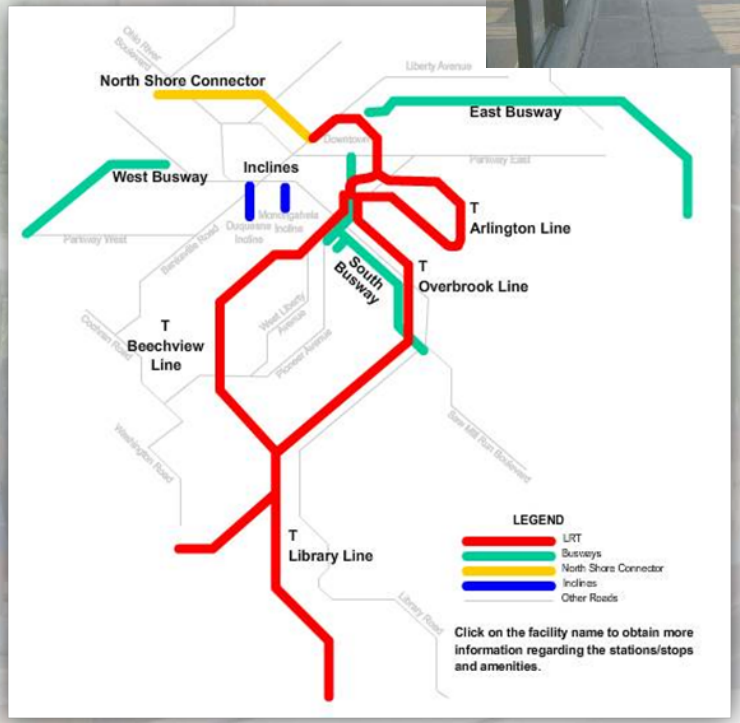
BRT Systems in the US

Dedicated Busways

- Limited-access facilities to improve bus access along congested corridors (typically into CBDs)
- Busway acts as a trunk-line, with local or express routes moving on and off of the corridor
- Services on the corridor are not typically branded
- Systems uses on-line stations

Dedicated Busways

Charlotte NC Busway



Busway System
Pittsburgh, PA

HOV BRT

- Concept grew out of previous busway design efforts
- Leverage upcoming highway improvements (i.e. high-occupancy vehicle lanes) to improve transit speeds and travel time reliability
- Systems typically use off-line stations

HOV BRT

Metro (I-45 North)
Houston, TX

Metro (I-10 West)
Houston, TX

BRT Circulators

- Dedicated, bus-only lanes for transit service in congested urban centers
- BRT Circulators used branding to distinguish service from existing local routes
- Services began to use passenger information kiosks and on-board screens to display arrival time information

BRT Circulators

Lymmo
Orlando, FL

Arterial BRT

- Arterial BRT service may or may not use dedicated rights-of-way
  - Contraflow lane sometimes utilized
- Arterial BRT service typically uses transit signal priority at signalized intersections
- Common characteristics of Arterial BRT service:
  - High-frequency service
  - Limited-stop service
  - Stylized shelters and buses
  - Real-time passenger information

Arterial BRT

MAX
Kansas City, MO

EmX
Eugene, OR

In Summary: Applications of BRT

- Long-distance commuter trips
  - If Right-of-way is available: Busway or Arterial BRT
  - If HOV lanes are available: HOV BRT
- Medium-distance trips
  - If Right-of-way is available: Busway or Arterial BRT
  - If Right-of-way is unavailable: Arterial BRT
- Short-distance trips
  - Circulator BRT
  - Arterial BRT

Recent Trends in BRT

- In 2007, two funding opportunities under New Starts
  - **Small Starts** program was implemented providing grants for capital costs associated with new fixed guideway systems, extensions, and bus corridor improvements.
    - $250 million project cost of which $75 Million from FTA.
    - 50% fixed guideway
  - **Very Small Starts** program was implemented for projects with costs less than $50 Million
    - Benefits 3,000 daily existing riders
    - Less than $3 million a mile

Recent Trends in BRT

- Service Elements
  - Transit Stations
  - Signal Priority/Pre-emption (for Bus/LRT)
  - Low Floor / Level Boarding Vehicles
  - Special Branding of Service
  - Frequent Service - 10 min peak/15 min off peak
  - Service offered at least 14 hours per day

Recent Trends in BRT

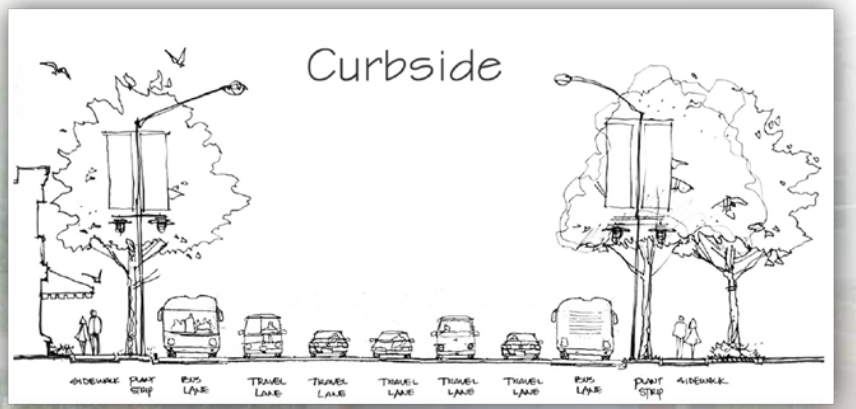
- Projects requesting federal funding were required to have a "medium" cost-effective rating giving bus projects a decided advantage over rail projects
  - In January 2010, the "medium" cost-effectiveness rating rescinded and new funding guidelines to consider livability issues such as economic development and environmental benefits
- Of the 18 approved Small Starts projects, 16 were for Arterial Bus Rapid Transit projects (all were Very Small Starts)
  - Some cities have even implemented BRT using local funds (ex. Nashville, TN/Tampa, FL - *planned*)

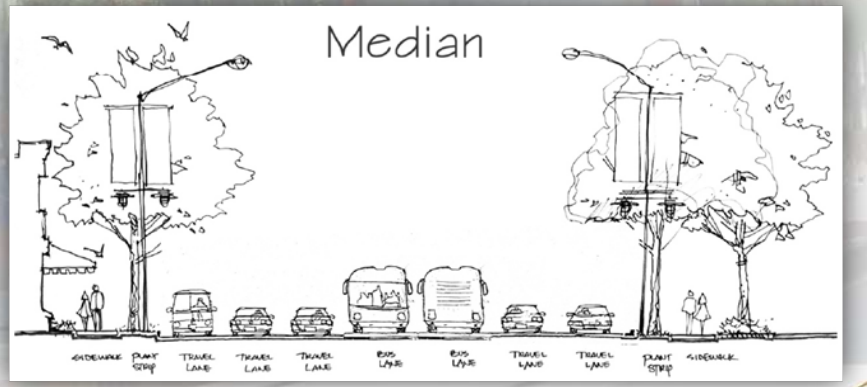
Arterial BRT Elements

- Operating Characteristics
  - Frequent Service - 10 min peak/15 min off-peak
  - Service offered at least 14 hours per day
- Running Way (lanes, queue jumpers)
- Stations
- Vehicles
- Advanced Technology
  - Transit Signal Priority
  - Fare Collection
- Service Branding

Exclusive Lane Treatments

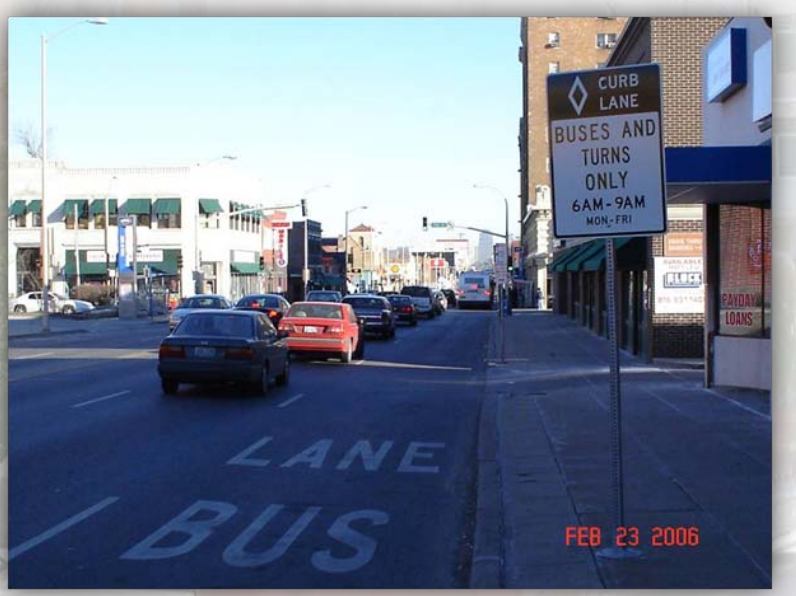
- Curbside
  - Kansas City
- Median/Curbside Hybrids
  - Orlando
  - Cleveland
  - Eugene
- Dedicated Lanes
  - Orange Line, Los Angeles





Curbside Lane Treatments

Lymmo
Orlando, FL



MAX
Kansas City, MO

Median Lane Treatments

EmX
Eugene, OR

RTA HealthLine
Cleveland, OH

Exclusive Lane Treatments

Orange Line
Los Angeles, CA

Mixed-Traffic Lane Treatments

- Most Arterial BRT systems operate in mixed-traffic to meet VSS $3M per mile cost threshold
- Many systems rely on Transit Signal Priority and "Queue Jumpers" to minimize delay at signalized intersections

Station Treatments

MAX
Kansas City, MO

Standard BRT Stops include:

- Unique shelter designs
- Branded pylon with station description
- Real-time passenger information signage

And may include:

- Fare collection equipment
- Lighting and surveillance equipment
- Raised curb for level boarding

Vehicle Treatments

- Depending on service frequency and ridership demand Arterial BRT routes may either use stylized Standard (40’) or Articulated (60’) buses.
  - BRT fleets may use hybrid buses to distinguish the service from the standard bus fleet and brand it as a premium, “green” service
  - BRT vehicles are typically equipped with passenger amenities such as padded seats, reading lights, wi-fi, etc.

Examples of Stylized 40’ Vehicles

40’ Gillig BRT

40’ New Flyer BRT

Examples of Stylized 60’ Vehicles

60’ New Flyer BRT

60’ NABI BRT

Other Advanced Technology Treatments

- Passenger Information Systems
  - Real-Time Passenger Information (on-vehicle, at shelters and online)
- Off-Board Fare Collection
- Smartcards

Branding

- Branding is requirement for SS and VSS funding
- Typical Branding Devices
  - Brand Name: MetroRapid, MAX, etc.
  - Unique Logo: Las Vegas, NV
  - Common Color: MetroRapid Red
  - Design Theme for Shelters

Costs of Representative BRT Projects

- RapidRide Blue Line (Albuquerque, NM)
  - 100% Mixed-traffic
  - 15 miles, 12 stations
  - Total Cost: $6M (2007 estimate)
  - Cost per Mile: $0.4M
- 3500 South BRT (Salt Lake City, UT)
  - 100% Mixed-traffic
  - 10 miles, 23 stations
  - Total Cost: $7M (2008 estimate)
  - Cost per Mile: $0.7M

Costs of Representative BRT Projects

- EmX Franklin Corridor (Eugene, OR)
  - 60% Exclusive
  - 4 miles, 10 stations
  - Total Cost: $24M (2007 estimate)
  - Cost per Mile: $6.0M
- Metro Orange Line (Los Angeles, CA)
  - 100% Exclusive
  - 14 miles, 14 stations
  - Total Cost: $350M (2005 estimate)
  - Cost per Mile: $25.0M

QUESTIONS?